

ABSTRACT OF THE DISCLOSURE

An integrated process and system for etching a hole in an oxide layer and conformally coating a liner for metal filling. The wafer with a patterned photoresist mask is loaded into a first transfer chamber held at a vacuum of less than 1 Torr. An oxide etch reactor etches the oxide down to a nitride etch stop and barrier layer to form a hole through the oxide. Thereafter, the photoresist is ashed, and the barrier layer is removed. The wafer is transferred through a gated vacuum passageway to a second transfer chamber held at a vacuum no more than 10^{-6} Torr. In at least two PVD or CVD deposition chambers connected to the second transfer chamber, a barrier layer of Ta/TaN is coated onto sides of the hole and a copper seed layer is deposited over the barrier layer. The invention may be limited to the operations subsequent to ashing.

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